Spectroscopy & the Dynamics of Molecular Biological Systems

Edited by P.M. Bayley and R.E. Dale

Academic Press; London, 1985

xiii + 406 pages. £38.50, $42.50

Some fifteen years ago it was assumed that the relationship between composition (sequence) and structure to function was straightforward. Attempts were then made to establish even enzyme mechanisms on the basis of refined X-ray diffraction structures. The development of high-resolution NMR methods quickly made everyone aware that the actual relationship was not direct and that the real relationship was between composition (sequence), dynamics within structure, and function. The use of even X-ray diffraction today extends to the study of some motions of low amplitude. The advances using these two methods are deliberately excluded from this book since there is a Ciba Foundation Volume (No. 93) which covers them. Here in 18 chapters by 41 authors the approaches used are optical, scattering (at various wavelengths) or EPR spectroscopies, together with powerful theoretical analyses of relaxation processes. The time resolution of the methods covers a very large range from picoseconds to days. The structural resolution is often poor in the sense that it is rarely atomic but many of the processes under study do not demand such resolution. Some examples of what these methods achieve are in areas where diffraction and NMR methods are not valuable. Interesting examples are the motions of molecules in simple free or viscous solution and in membranes. It is now established that some regions in and around cells are quite viscous. Again we now know that assembly and disassembly of structures in membranes can be quite rapid on the millisecond scale. The rotational motions in any medium, aqueous or membranes, can be exceedingly rapid – in the nanosecond range. Even faster processes in the picosecond range are open to study by many of the techniques discussed here. These processes are usually concerned with light-dependent excited states. While the book gives many examples it is over-ridingly a book about techniques. As such I found it to be very good indeed and very readable. The methods are bringing to our attention many dynamic processes which are at the heart of living systems.

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Genome Multiplication in Growth and Development: Biology of Polyploid and Polytene Cells

(Developmental and Cell Biology Series no. 15)

by V.Y. Brodsky and I.V. Uryvaeva

Cambridge University Press; Cambridge, 1985

305 pages. £39.50, $79.50

Biological research in the Soviet Union rarely makes the headlines in Western mainstream journals. A few Russian books on biological themes have made an appearance in English translation,